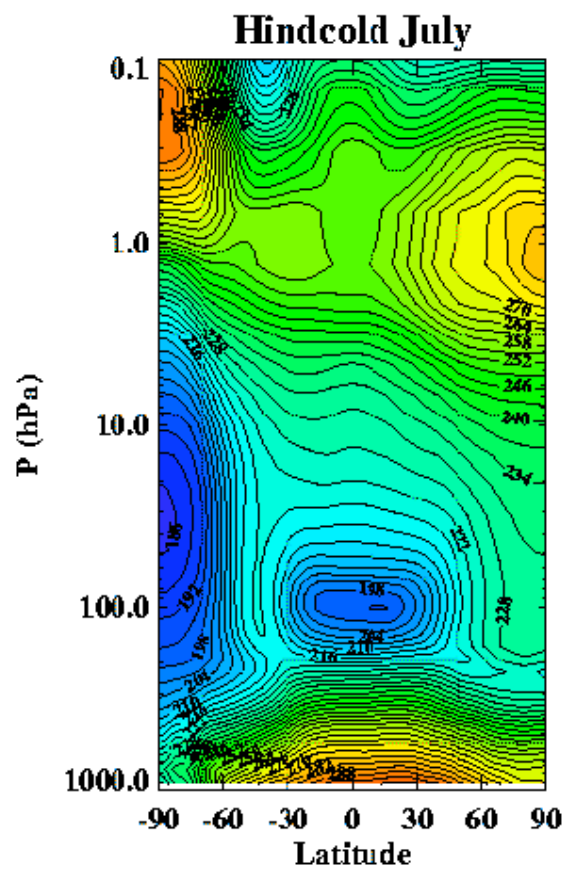
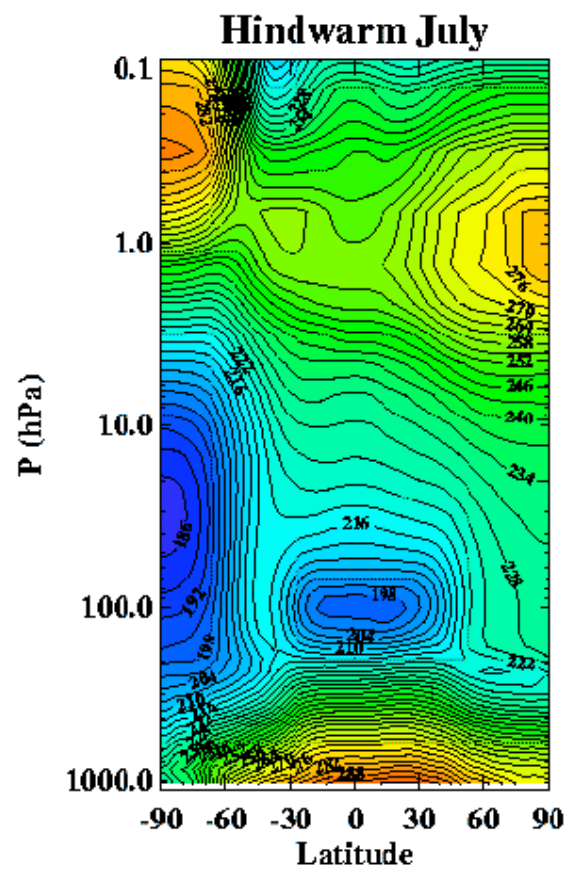
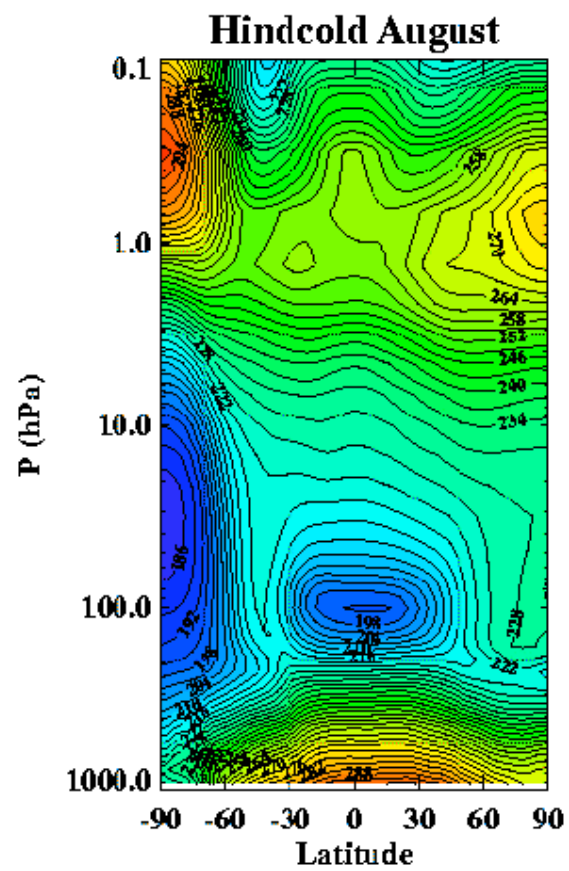
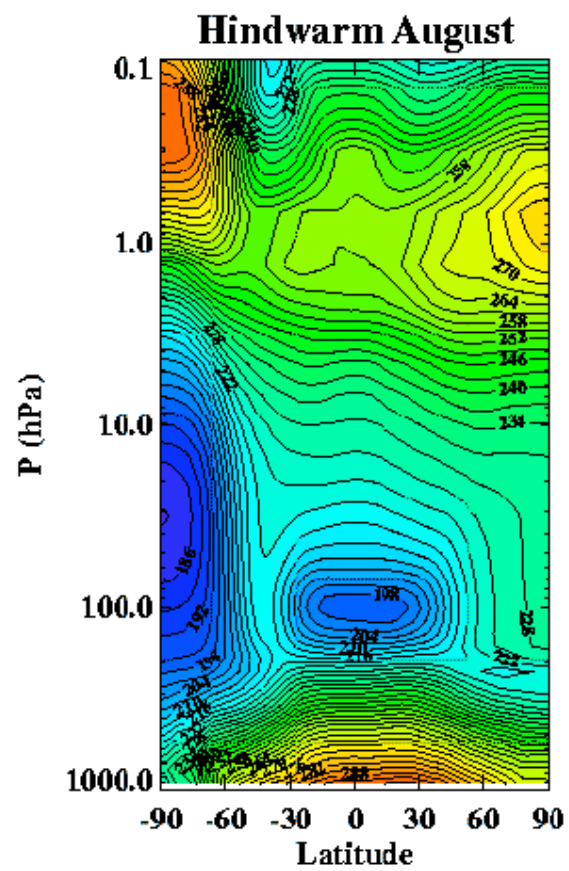


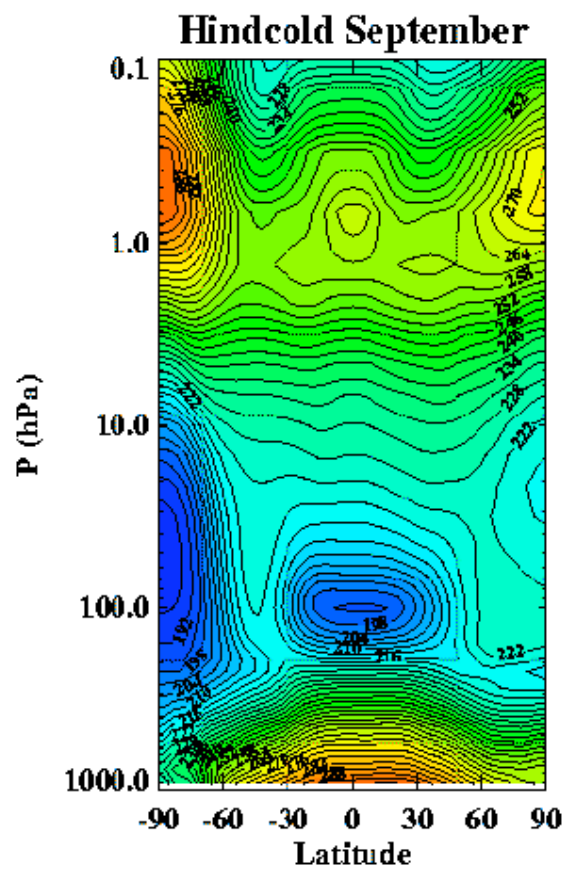
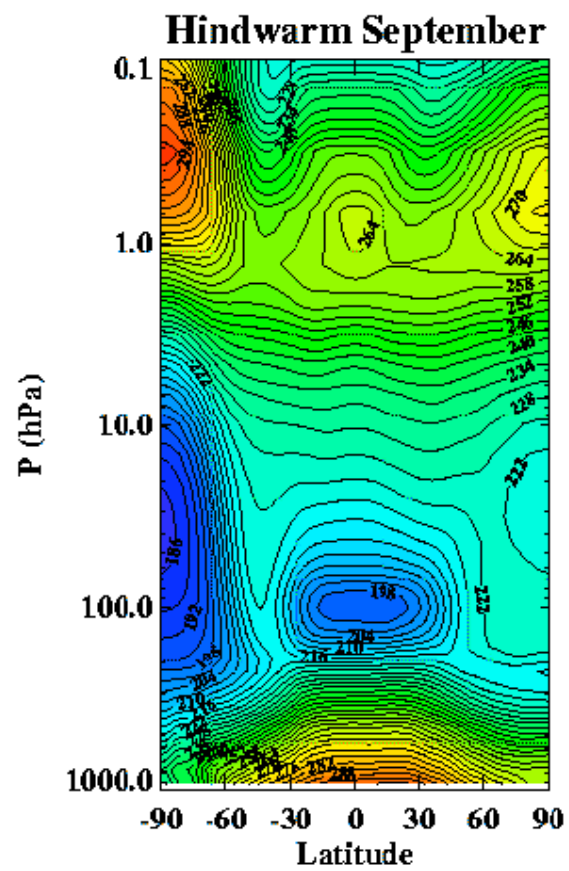
# **GMI Hindcast/Forecast Simulations of Stratospheric Photochemistry**

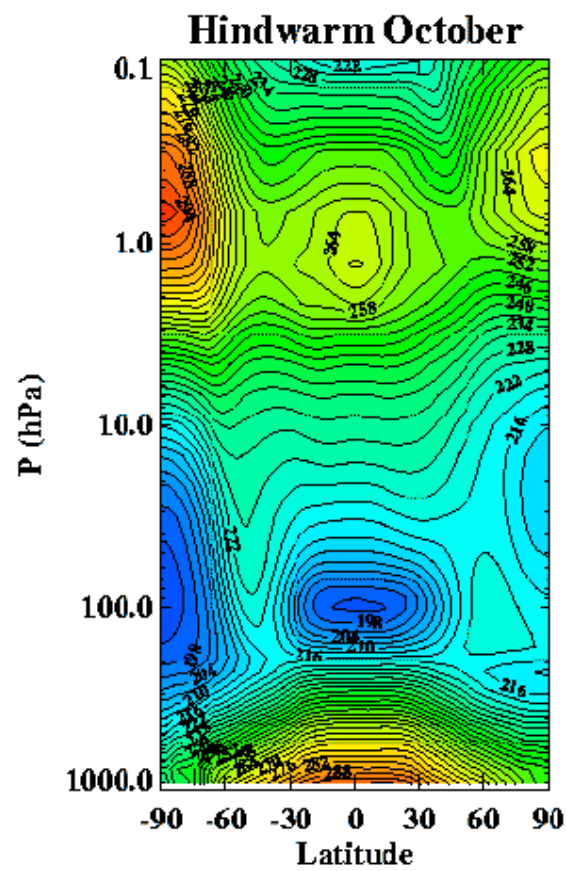
- **Used repeating dynamics from 50-year simulation of FVGCM**
- **2 Cases**
  - **Warm NH stratosphere**
  - **Cold NH stratosphere**
- **50-year simulations 1974-2023 with**
  - **Time-varying chlorine/bromine sources**
  - **Volcanic aerosols**
  - **Solar cycle UV variation**

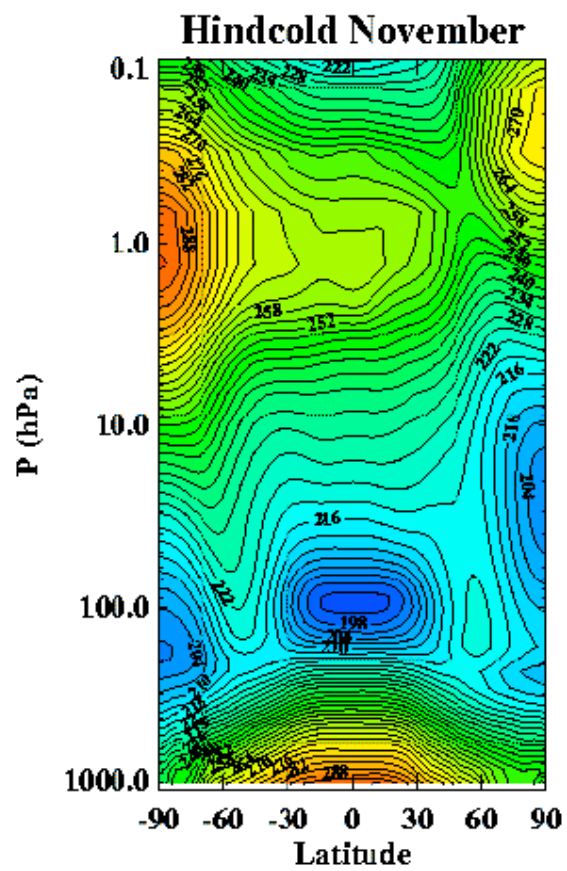
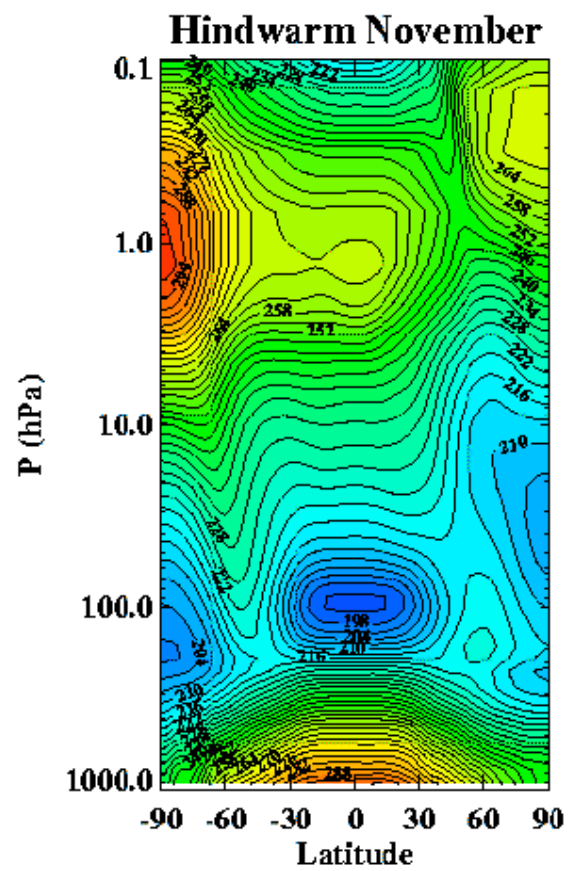
# Temperature

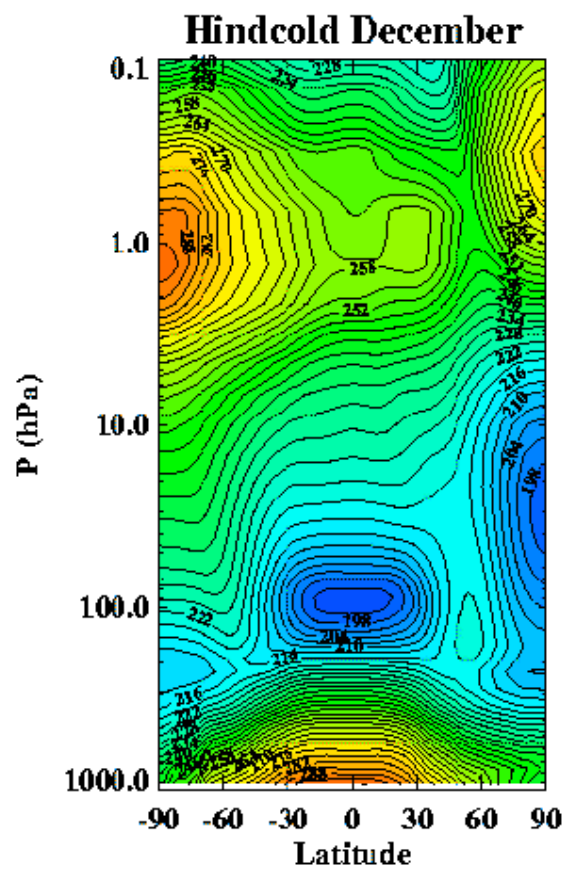
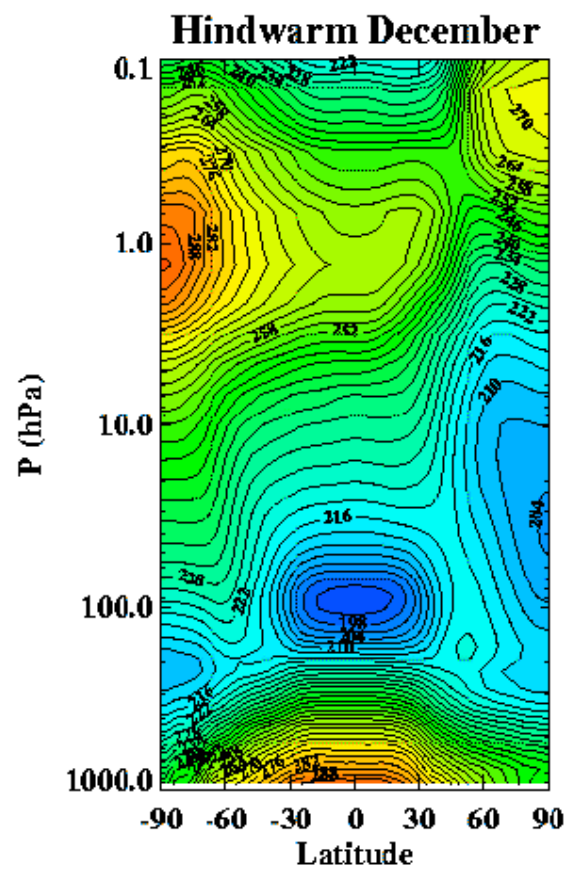




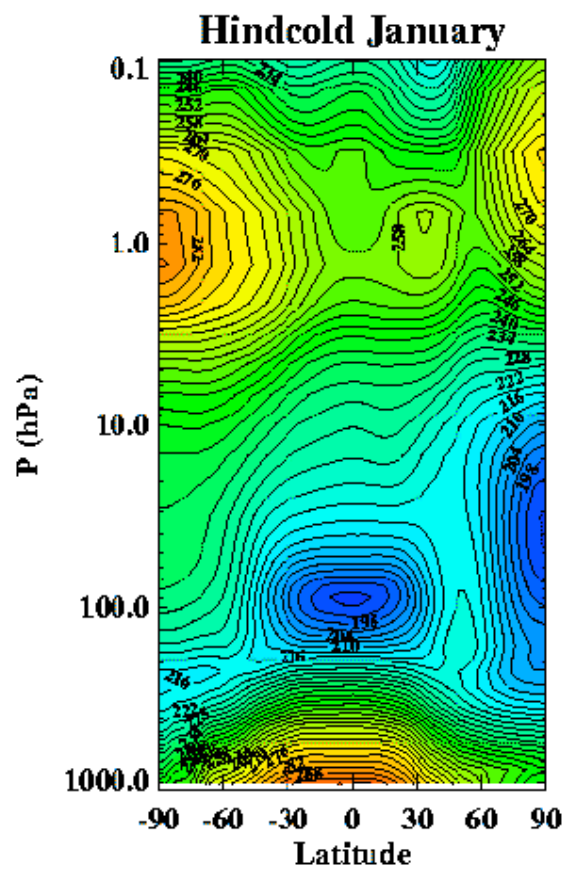
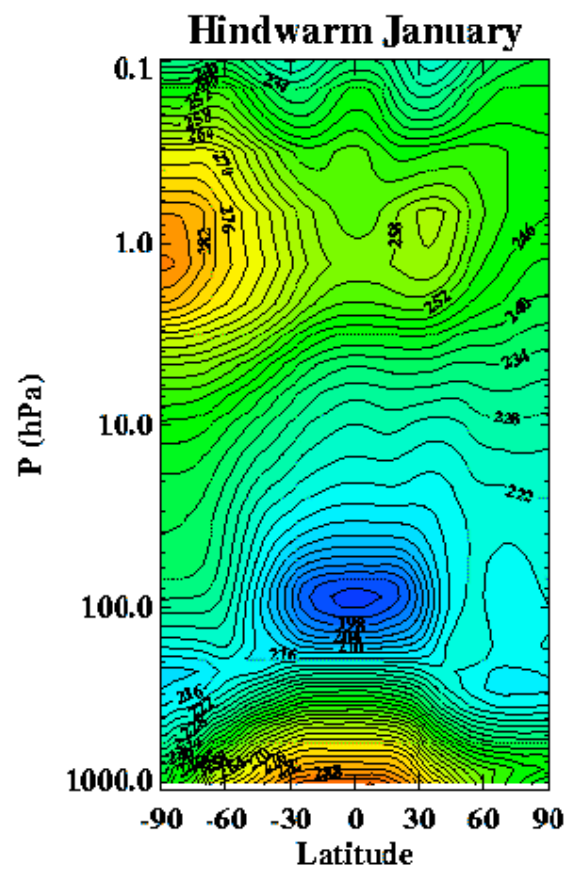


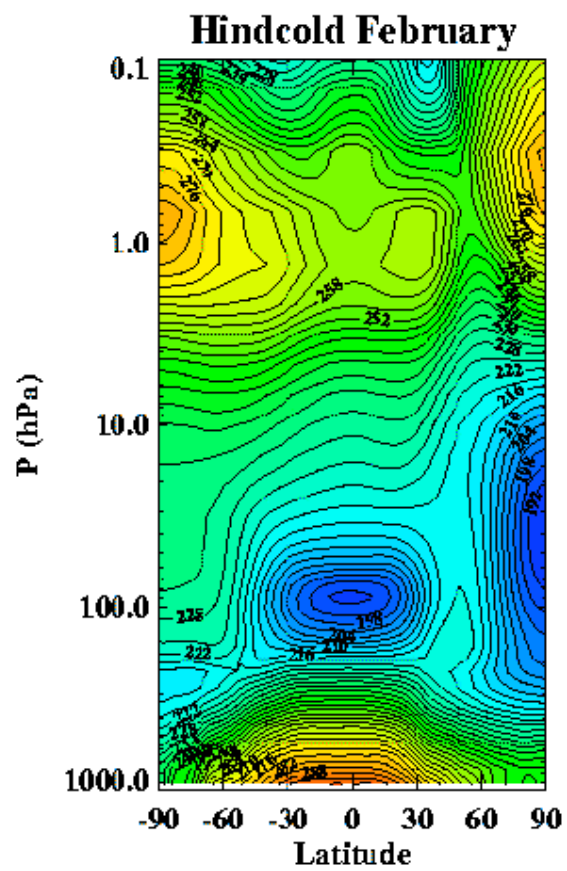
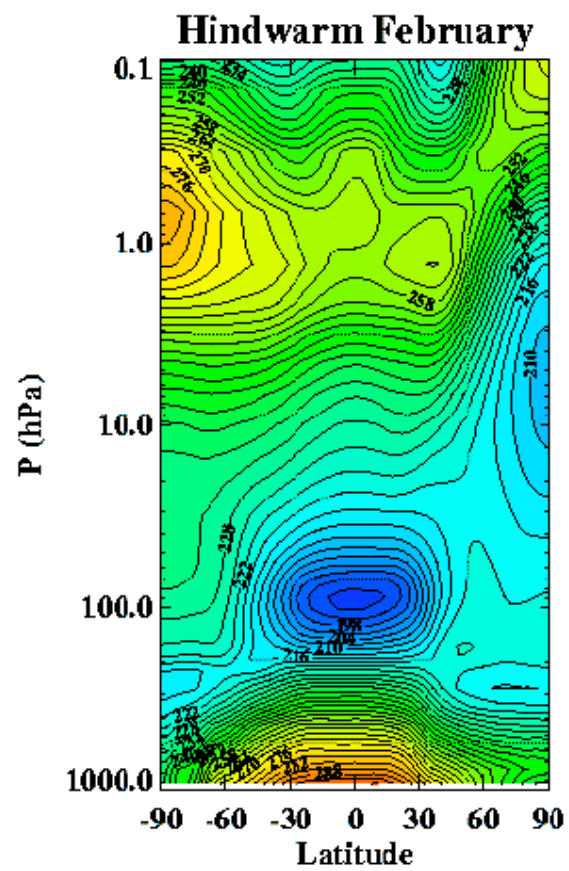


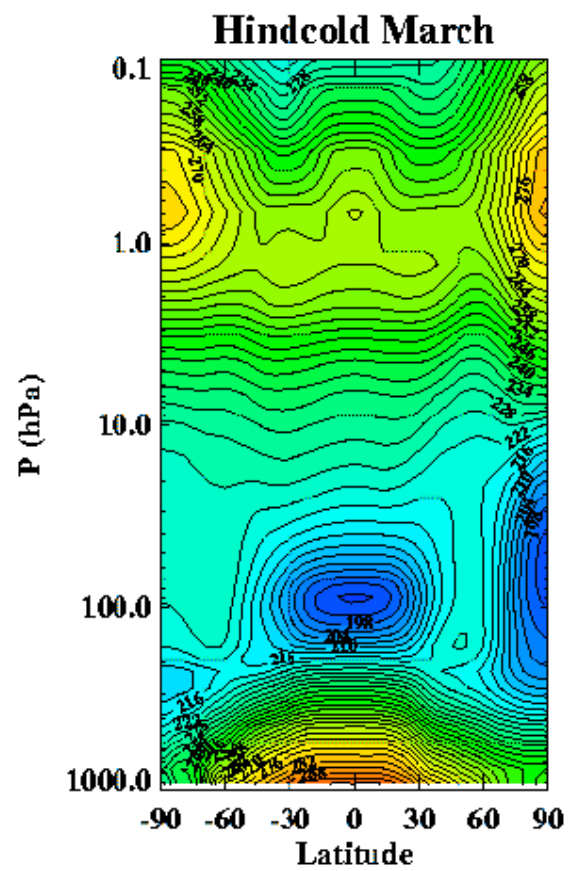
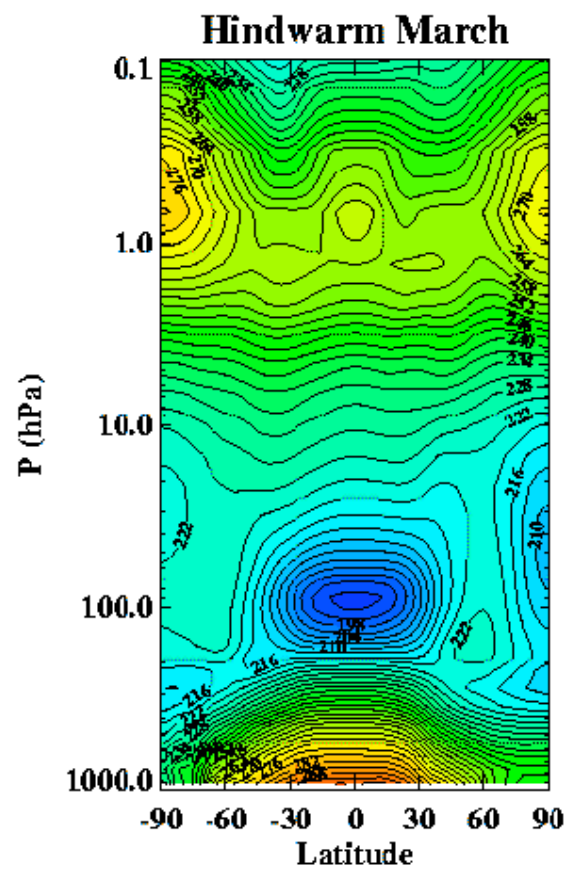


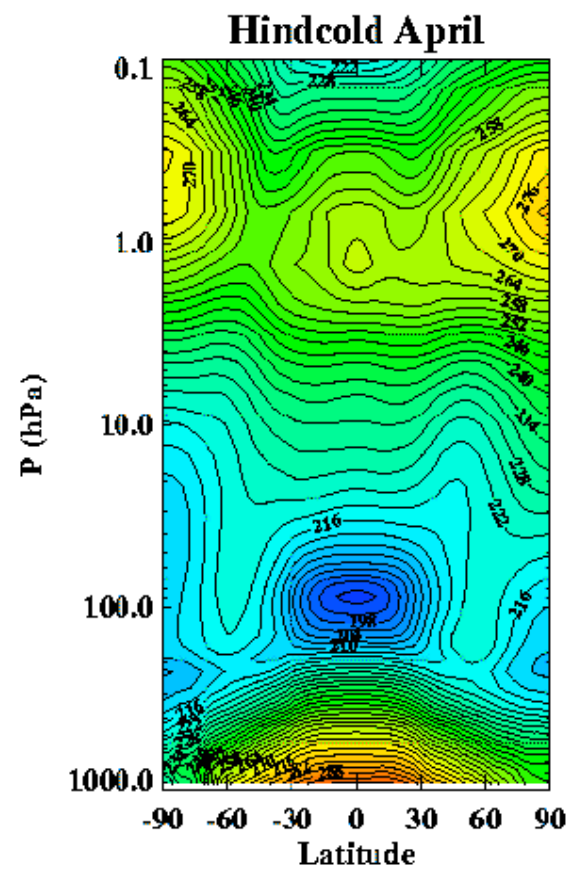
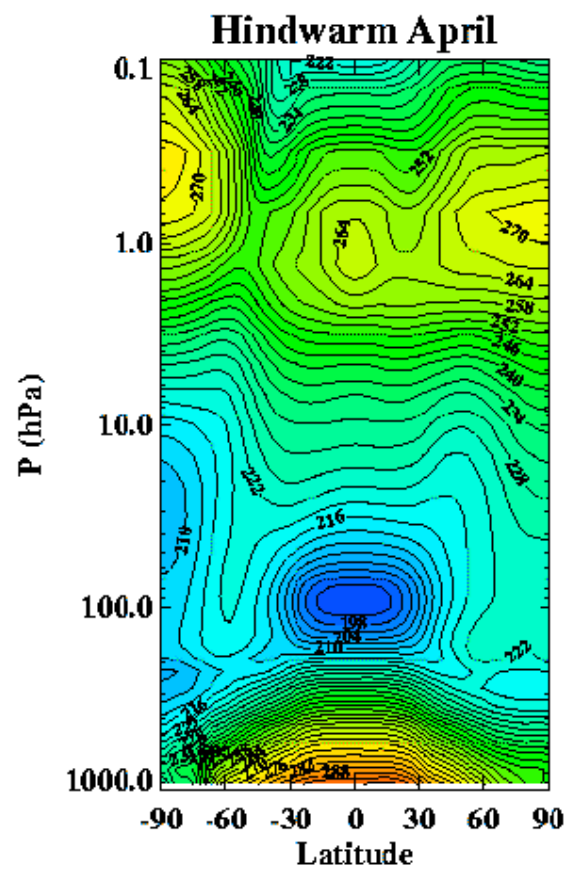


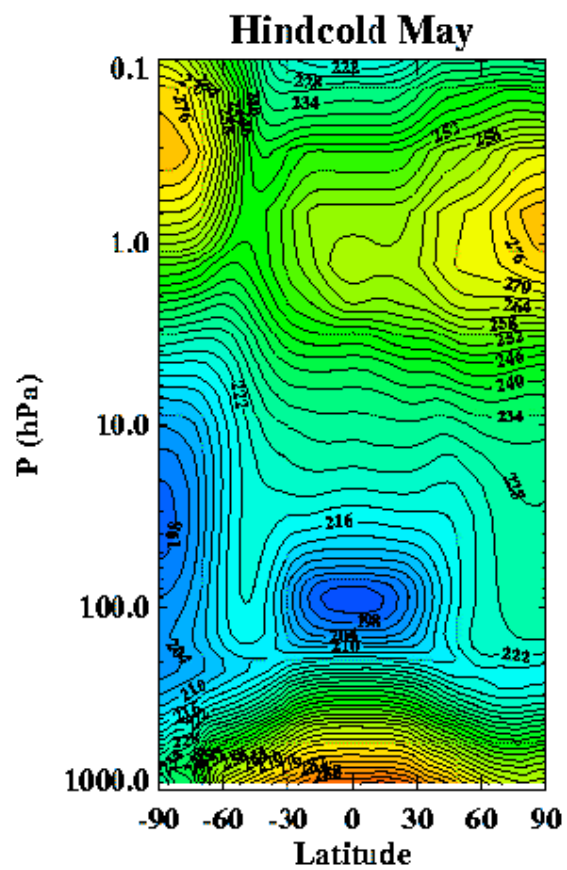
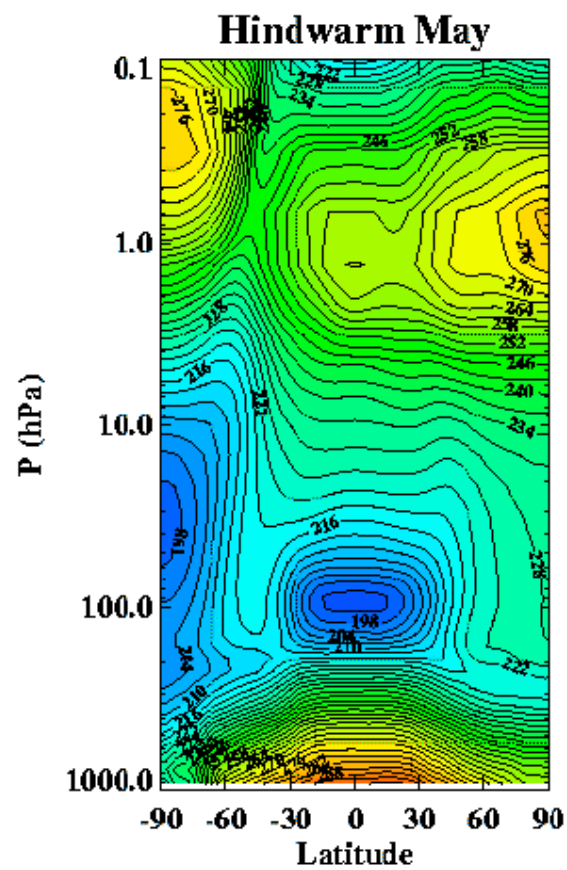


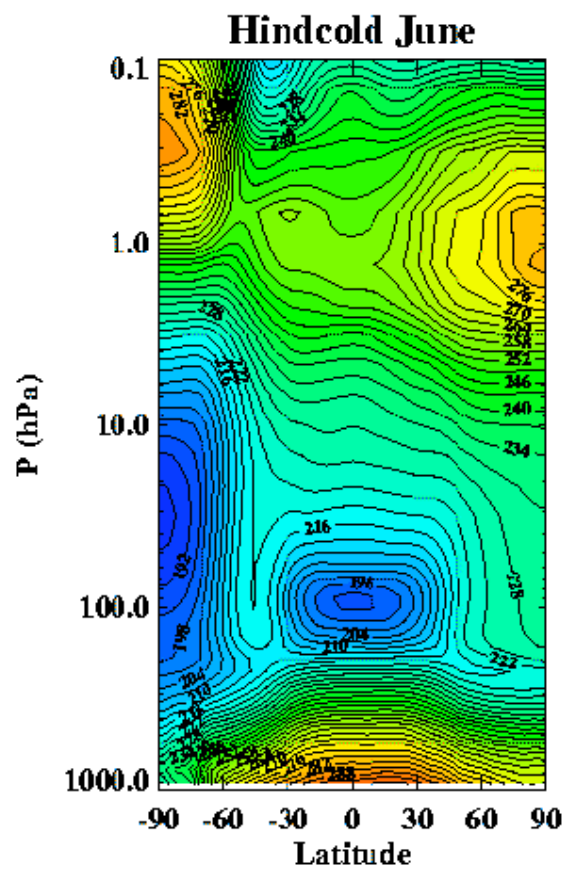
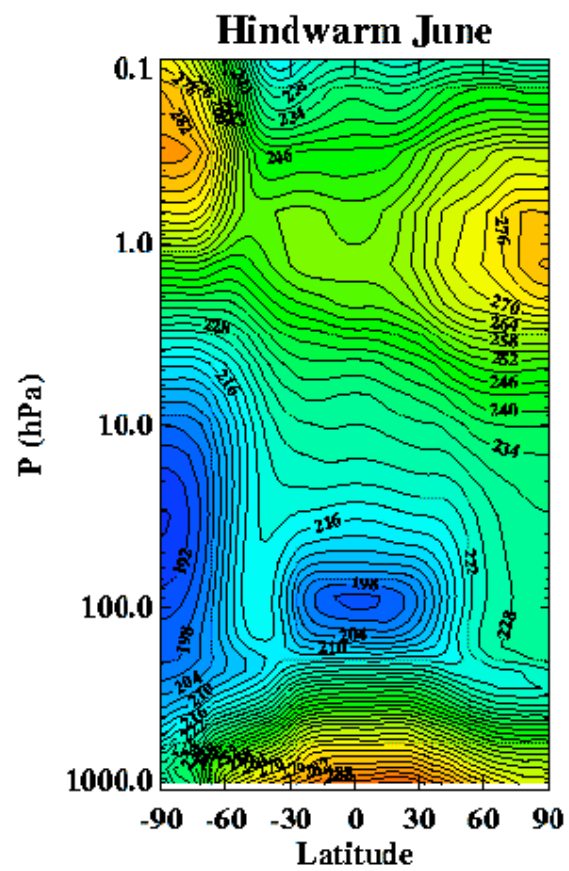






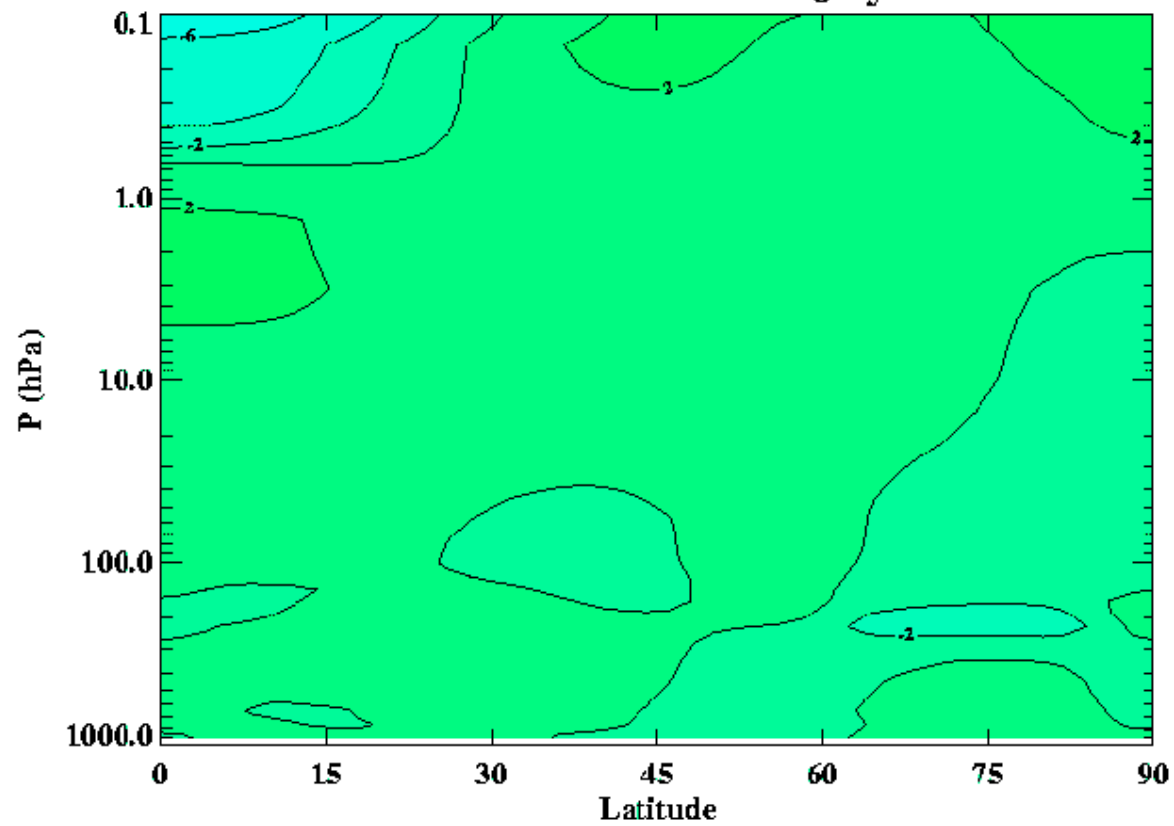




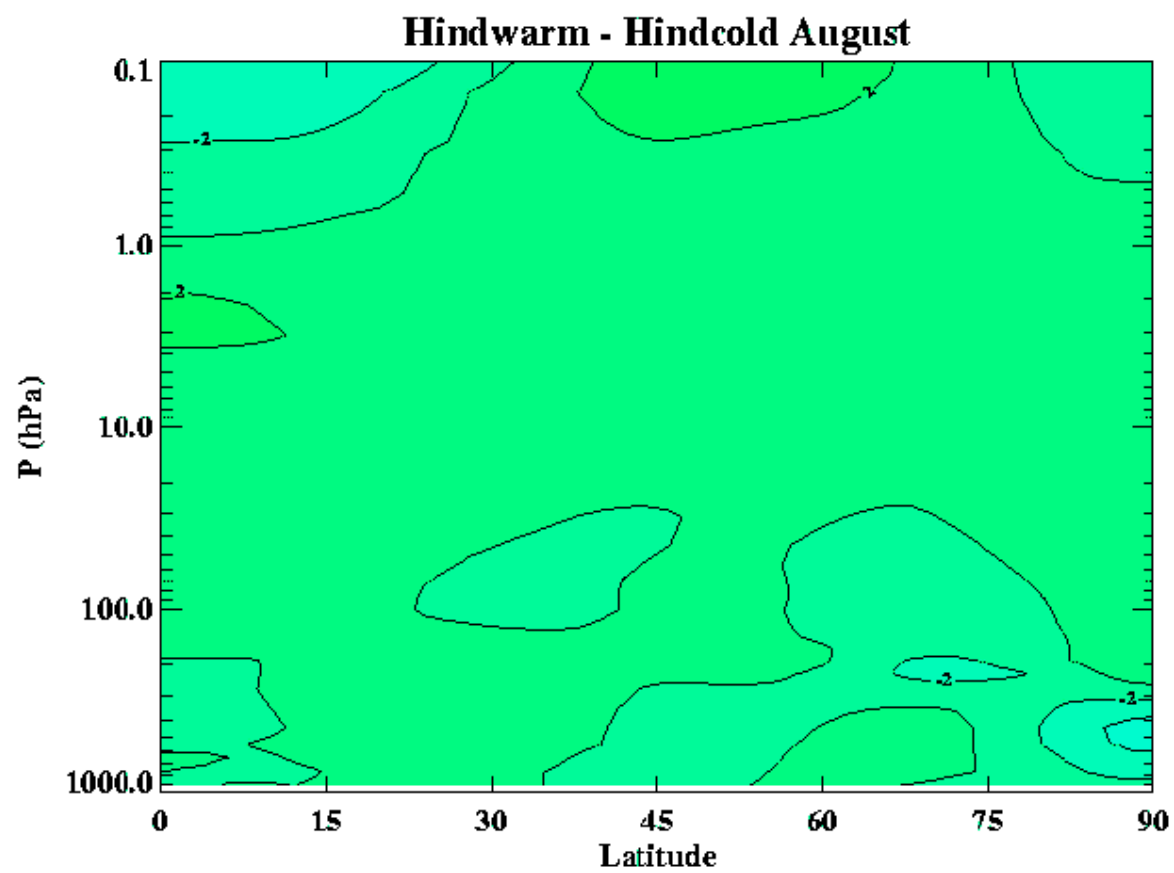


# **Temperature Difference Northern Hemisphere**

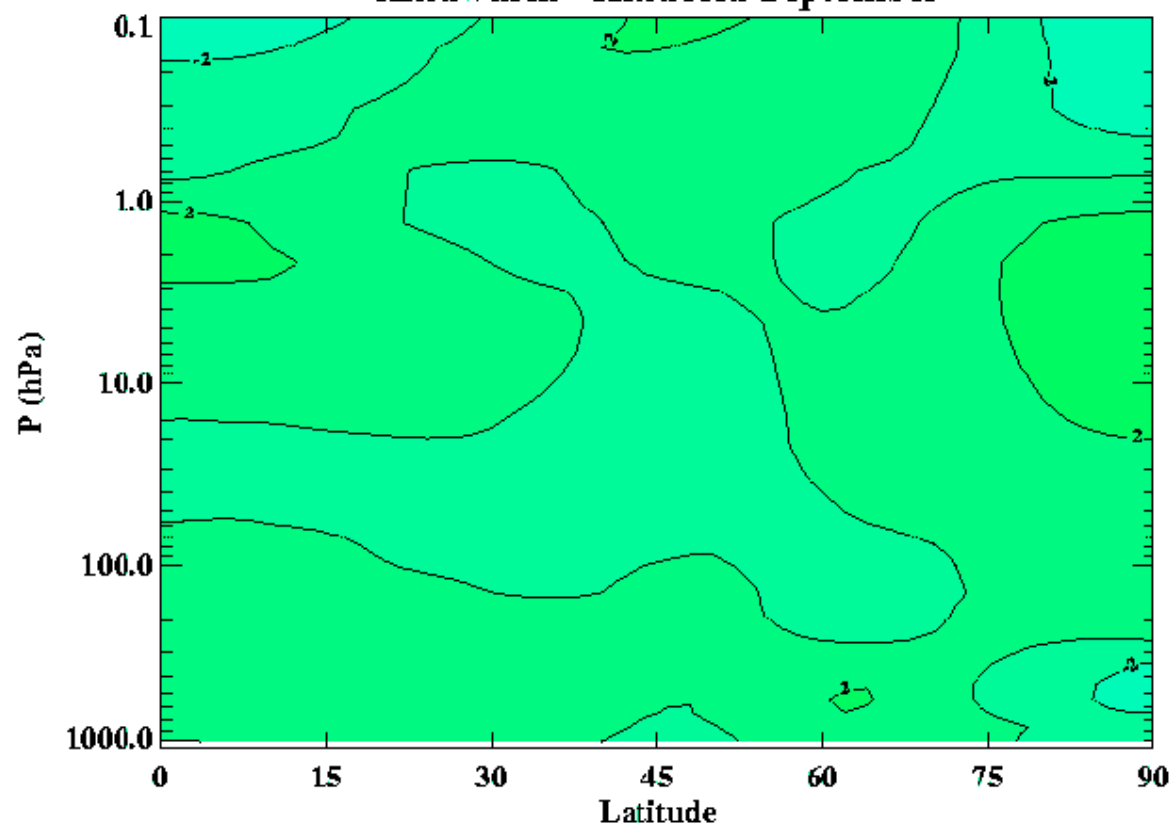
### Hindwarm - Hindcold July



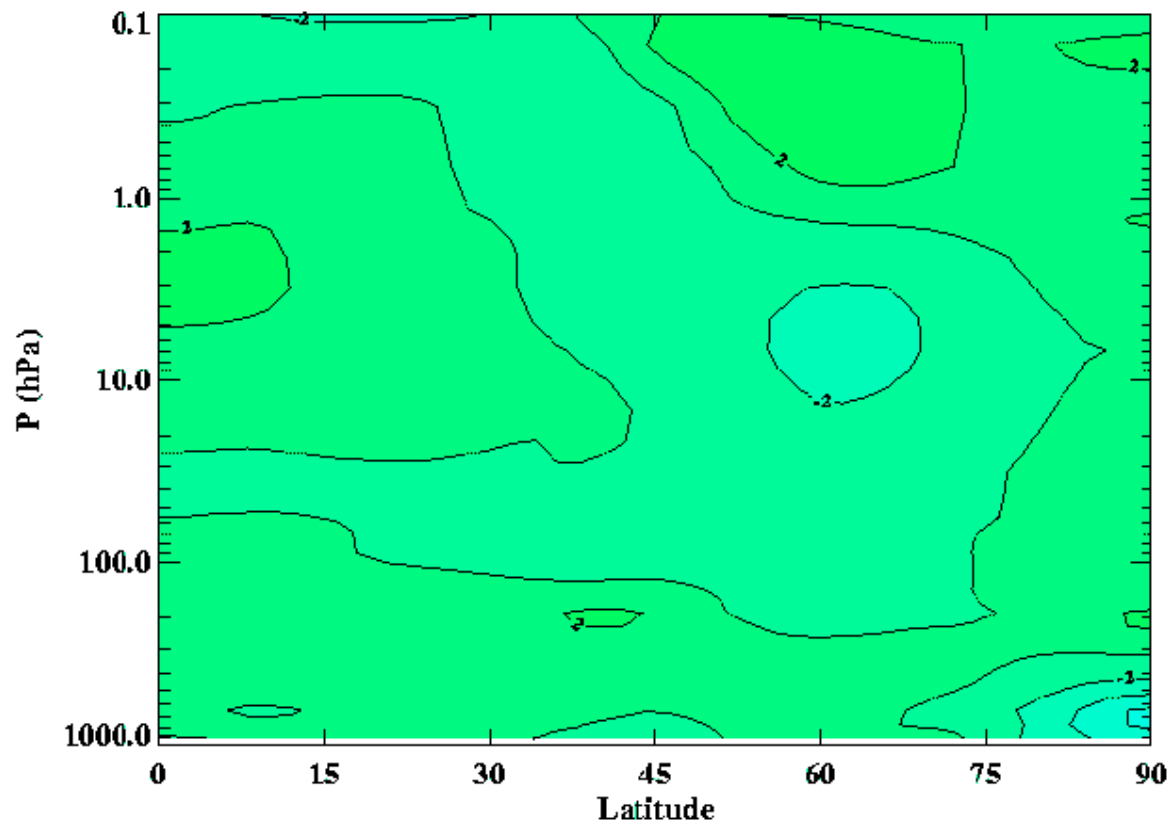




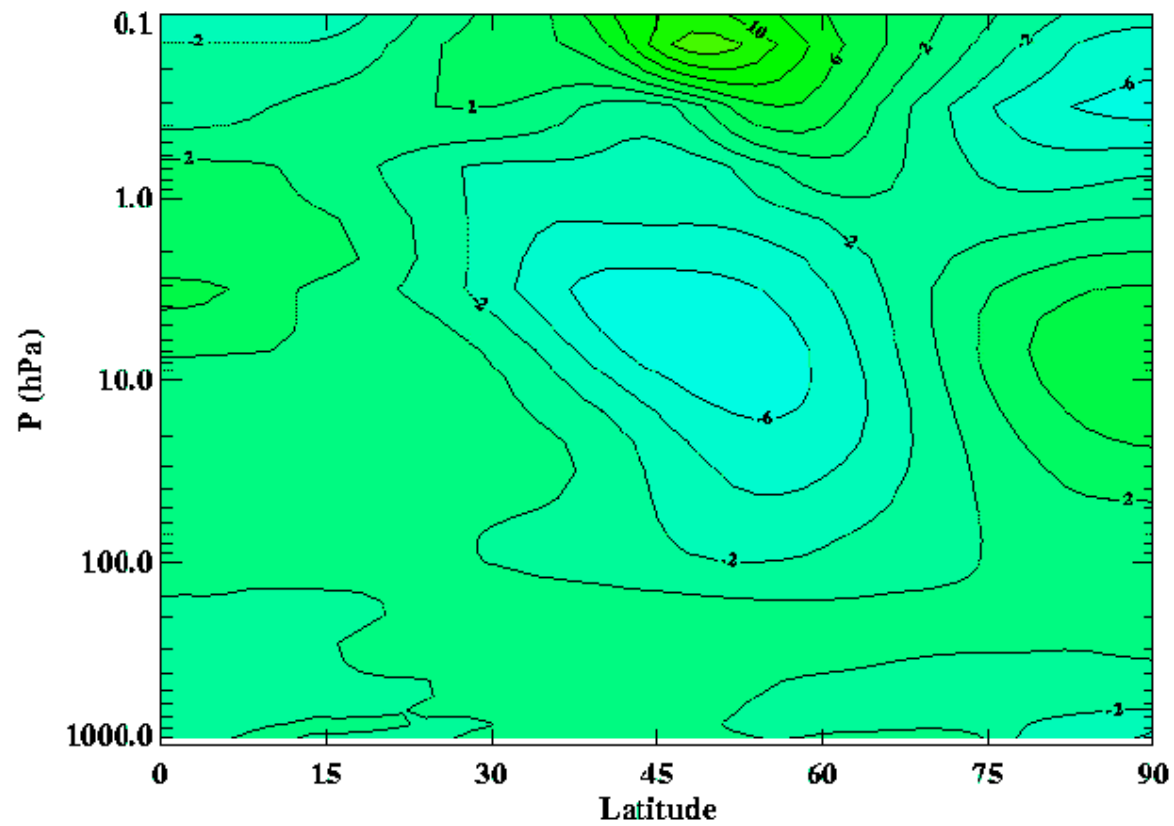
### Hindwarm - Hindcold September



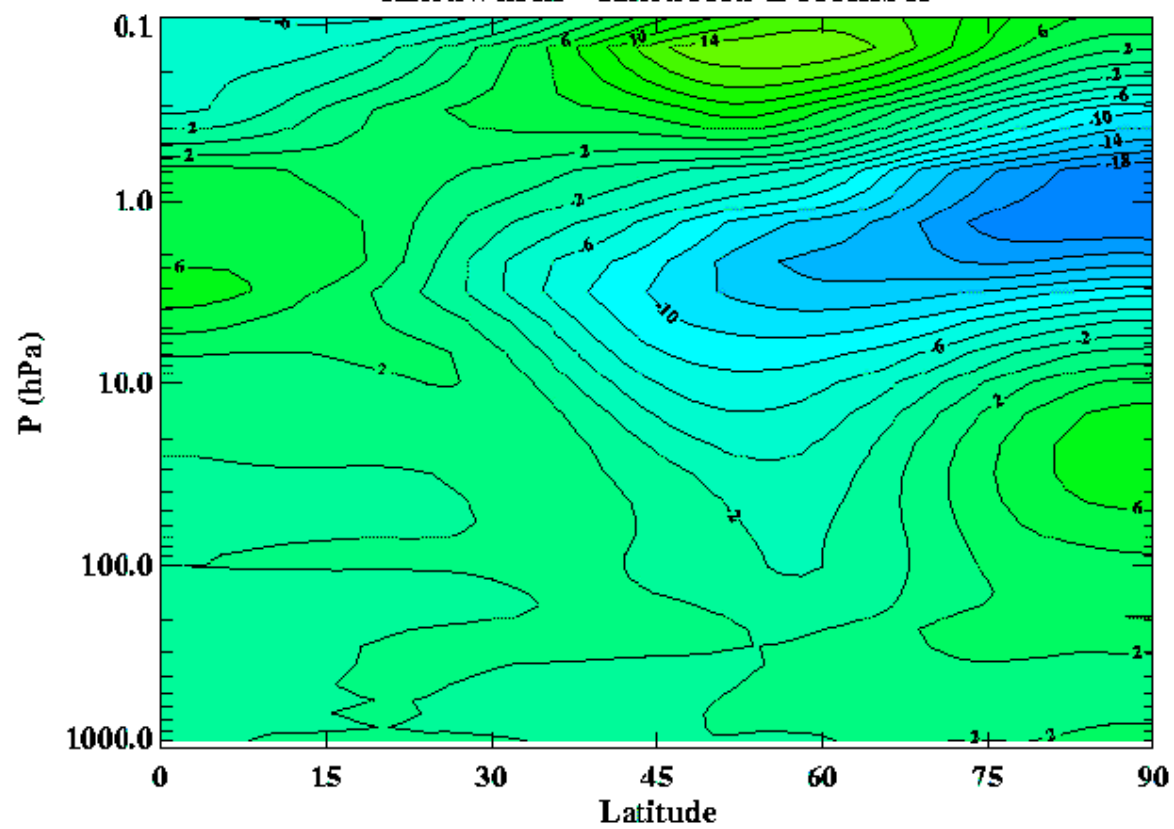
### Hindwarm - Hindcold October



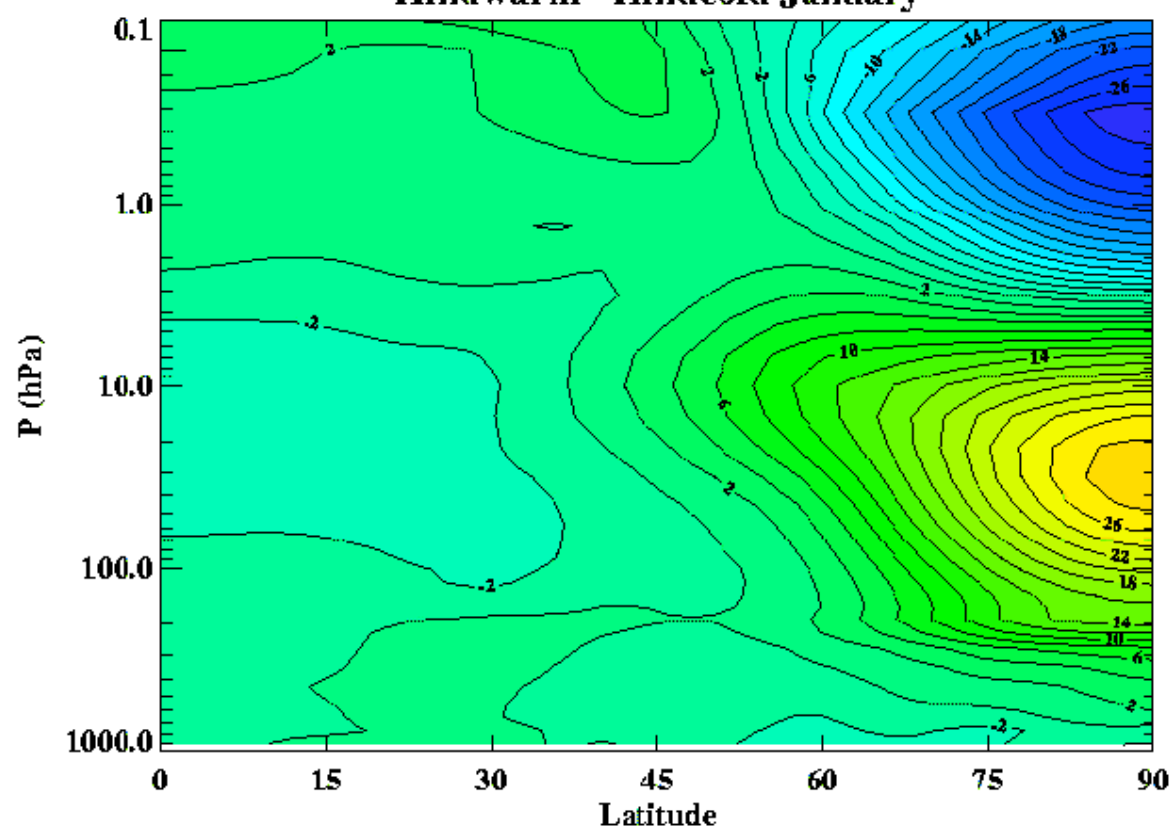
### Hindwarm - Hindcold November



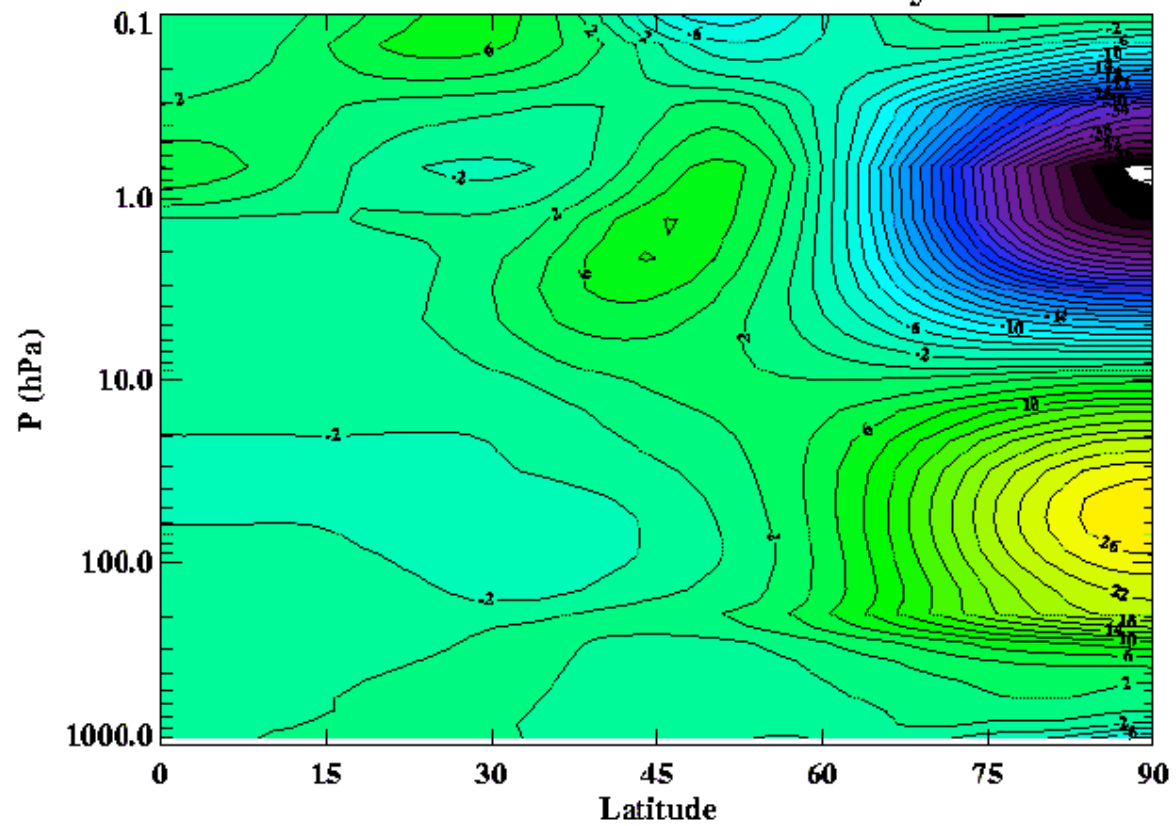
### Hindwarm - Hindcold December



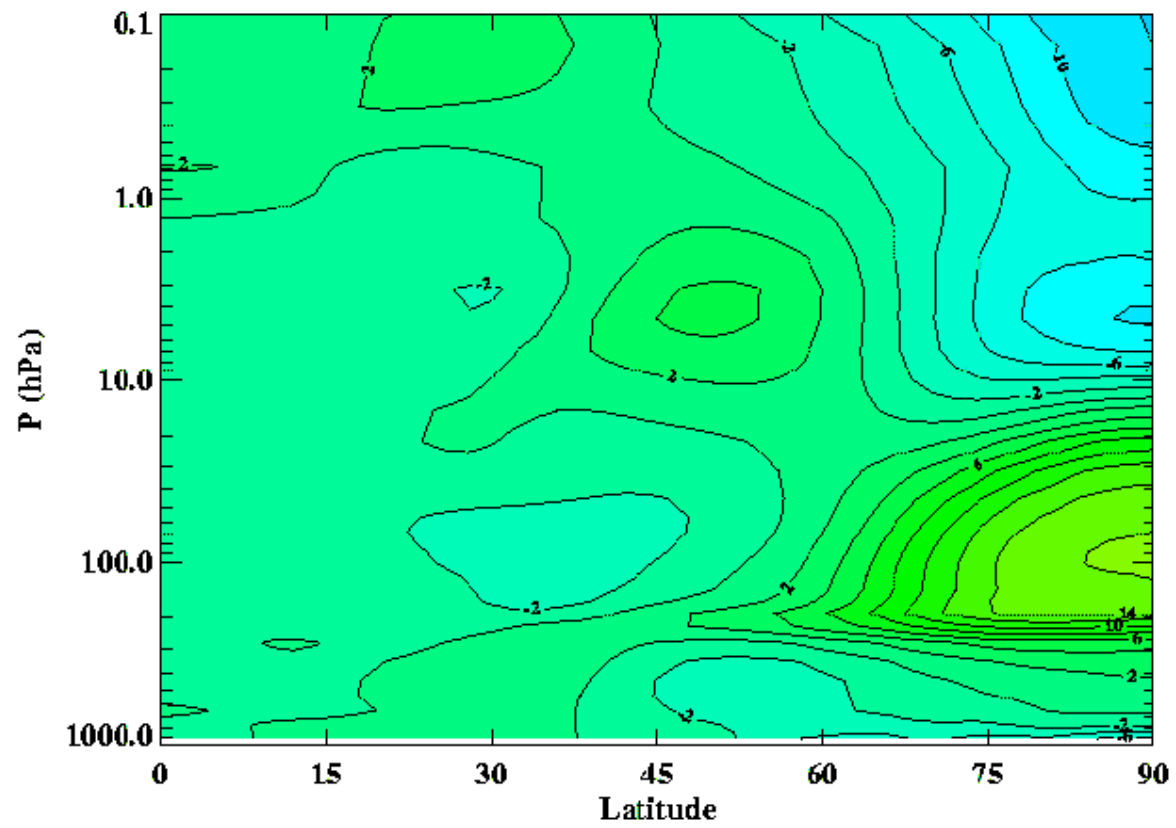
# Hindwarm - Hindcold January



### Hindwarm - Hindcold February

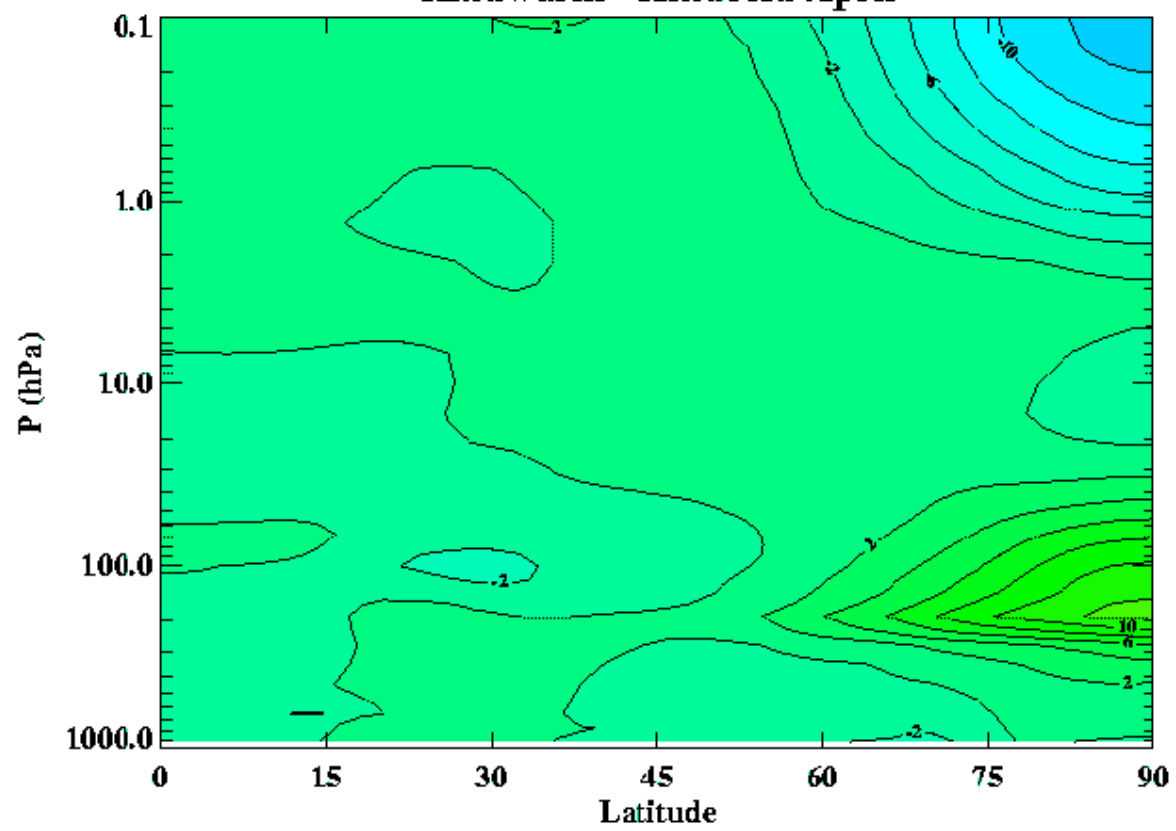


### Hindwarm - Hindcold March

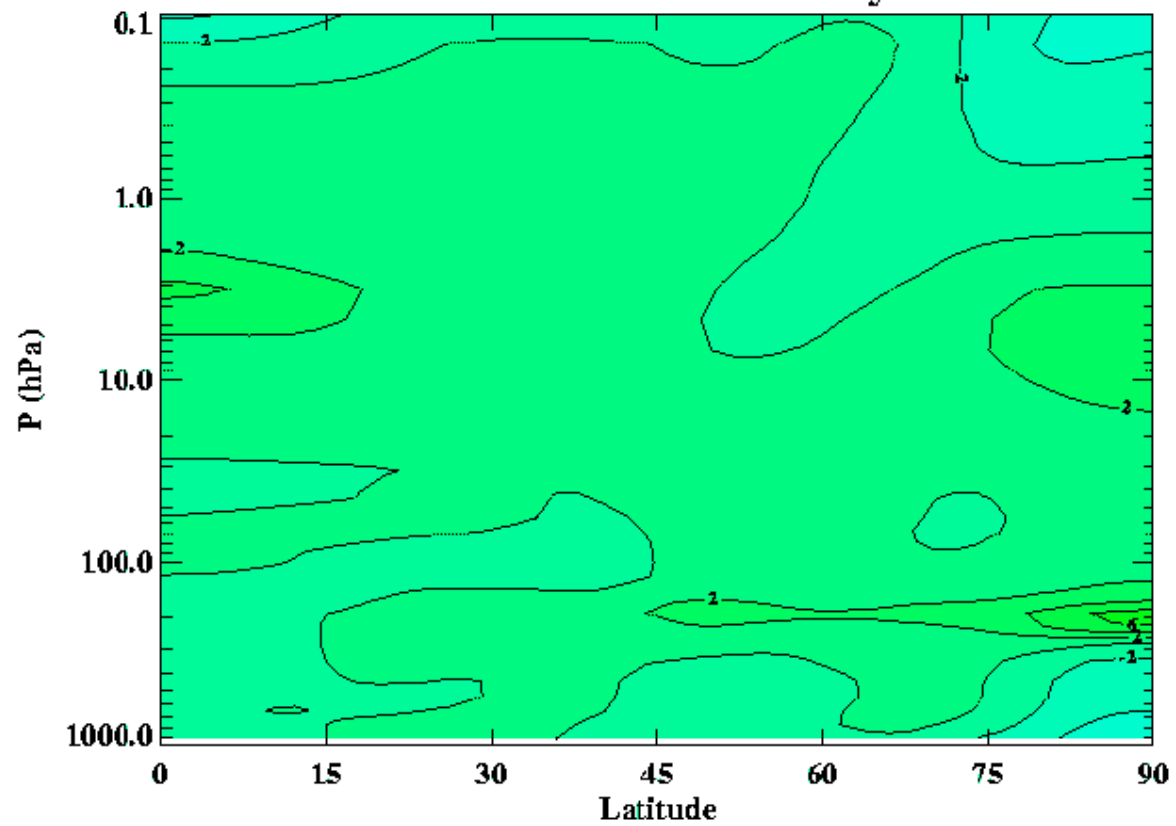




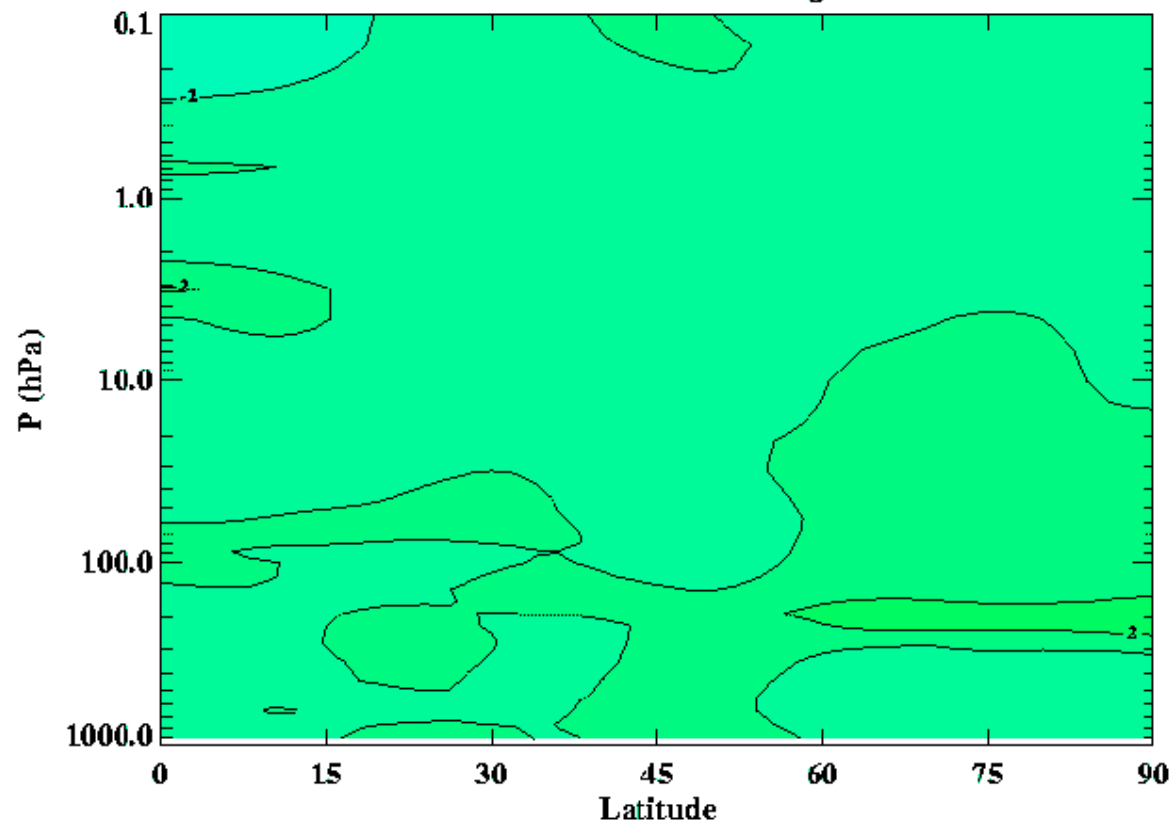
### Hindwarm - Hindcold April



### Hindwarm - Hindcold May

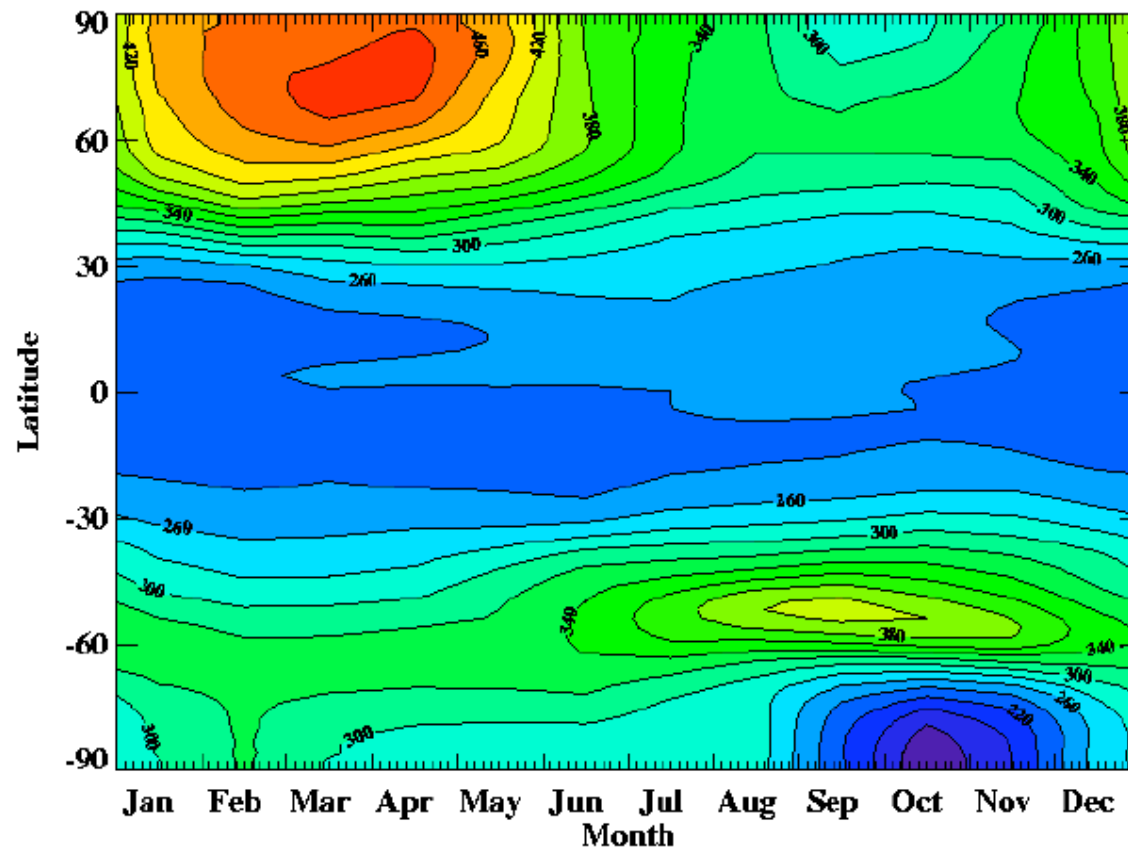


### Hindwarm - Hindcold June

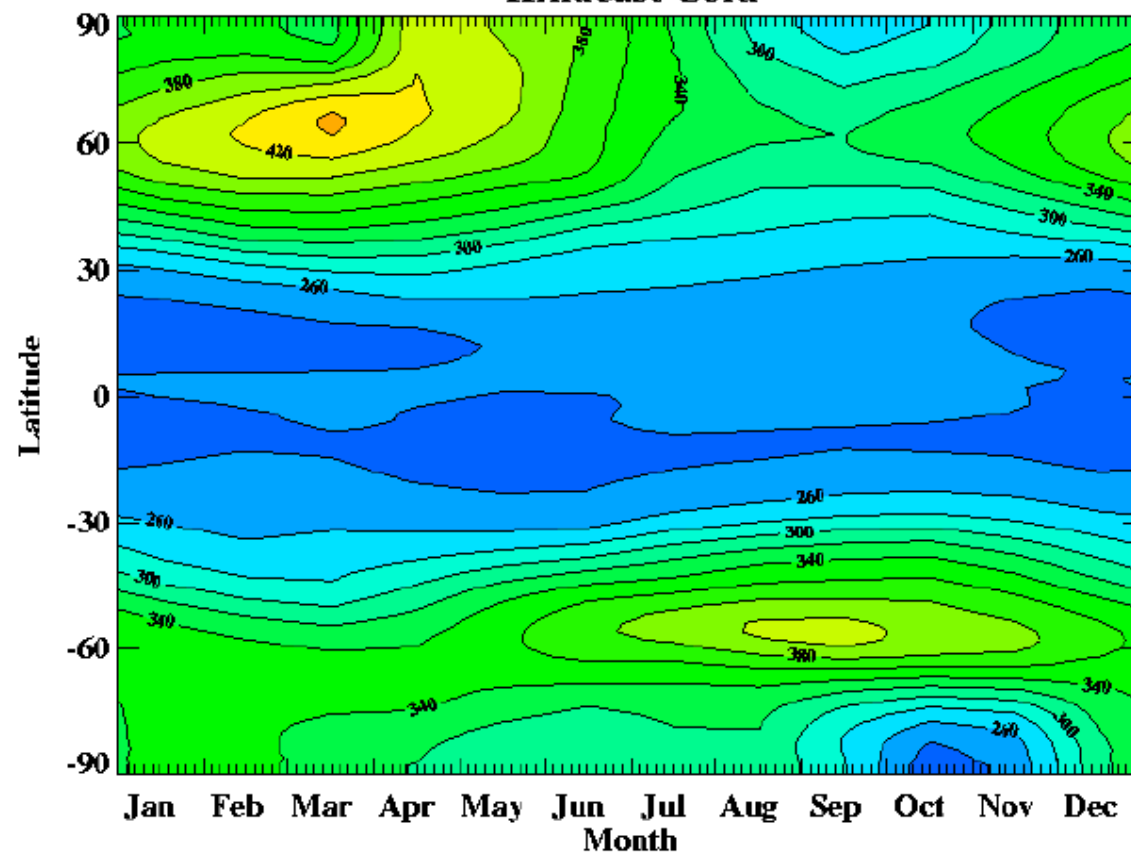


# **Total Column Ozone**

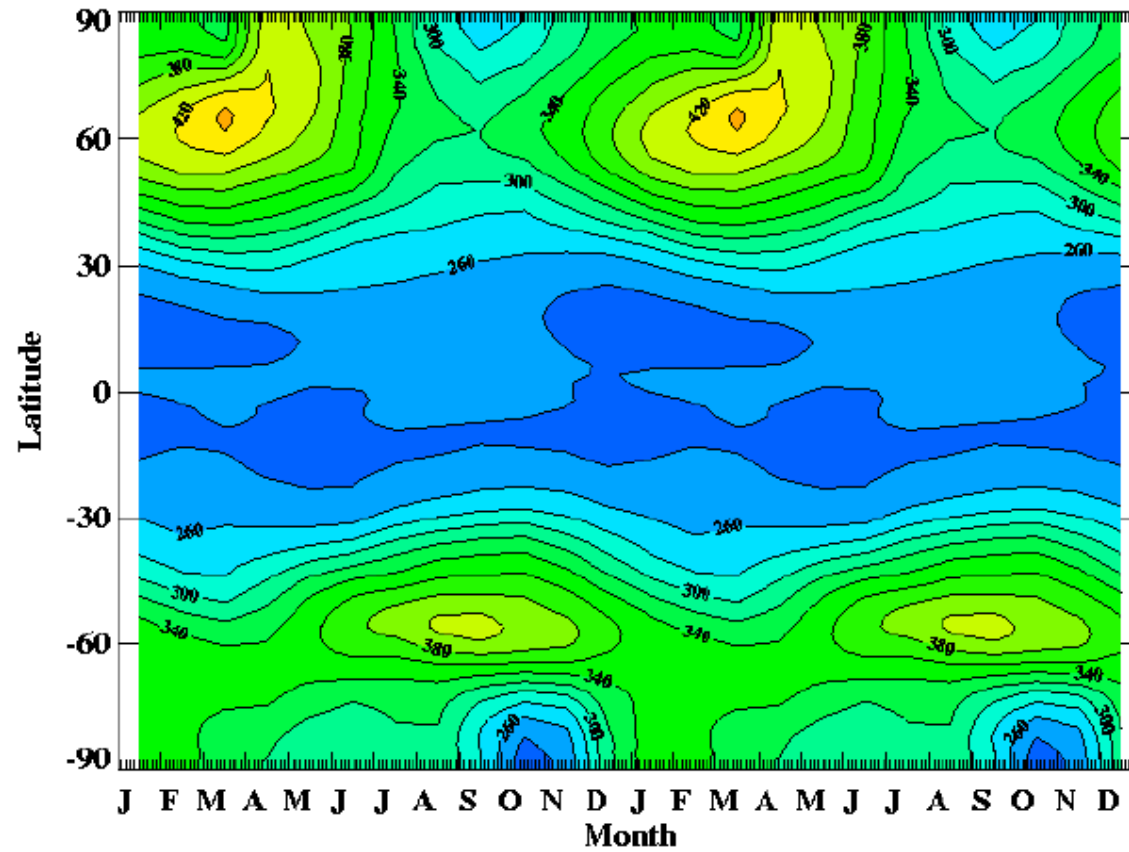
### Hindcast Warm



## Hindcast Cold

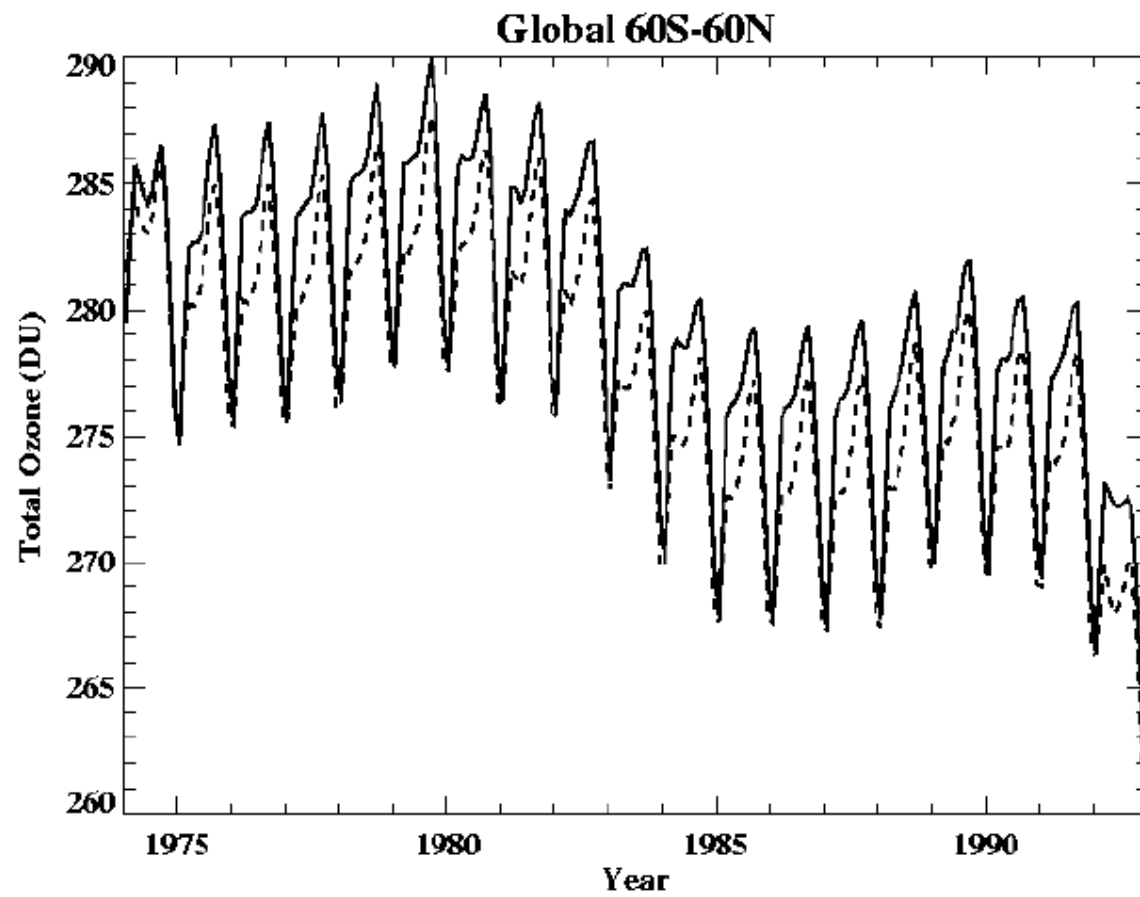


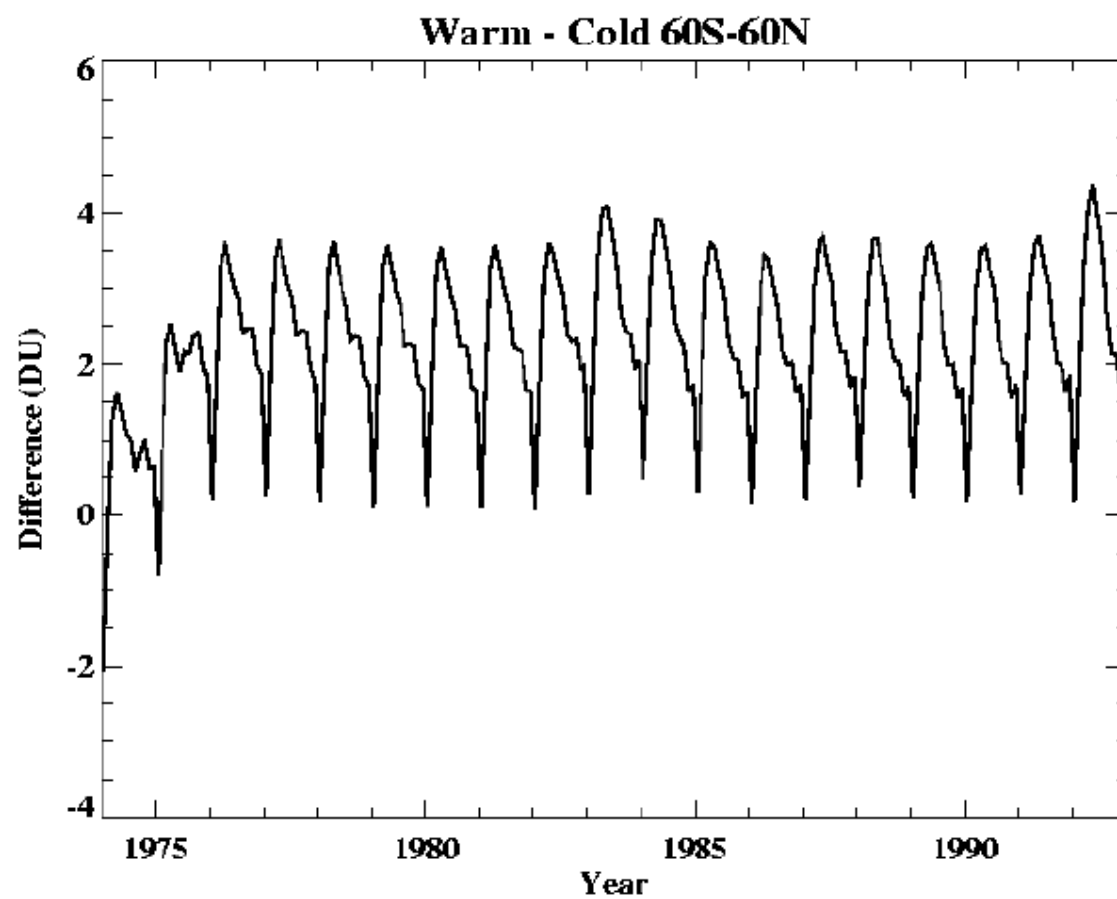
### Hindcast Cold

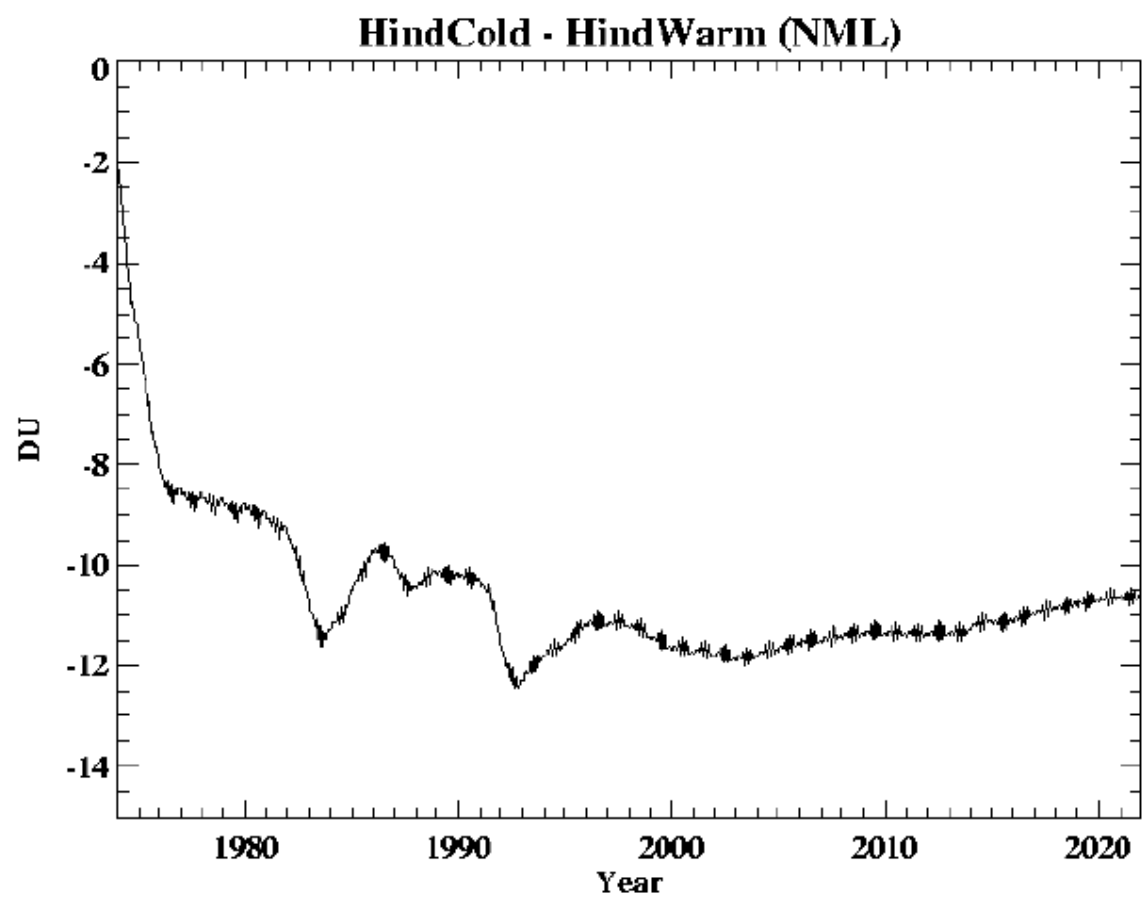


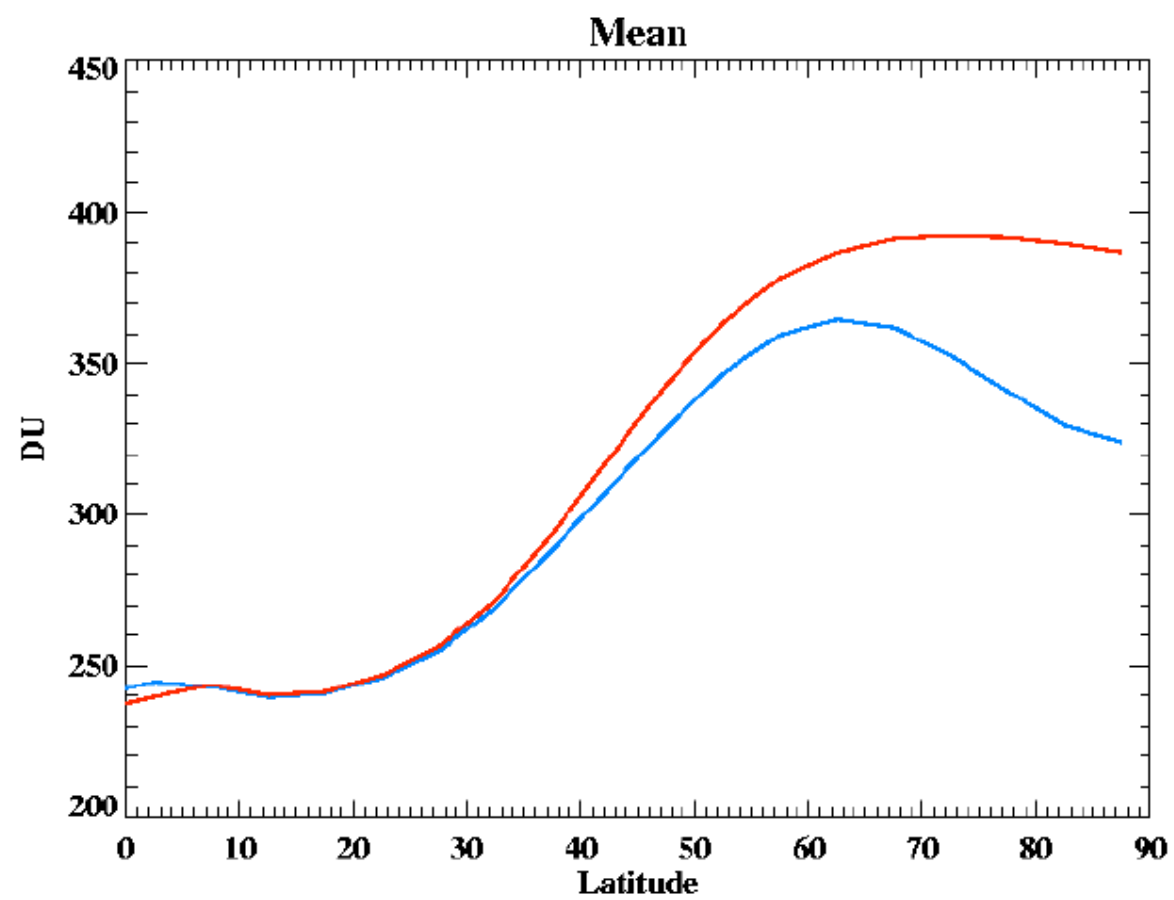
# **Ozone Comparisons**



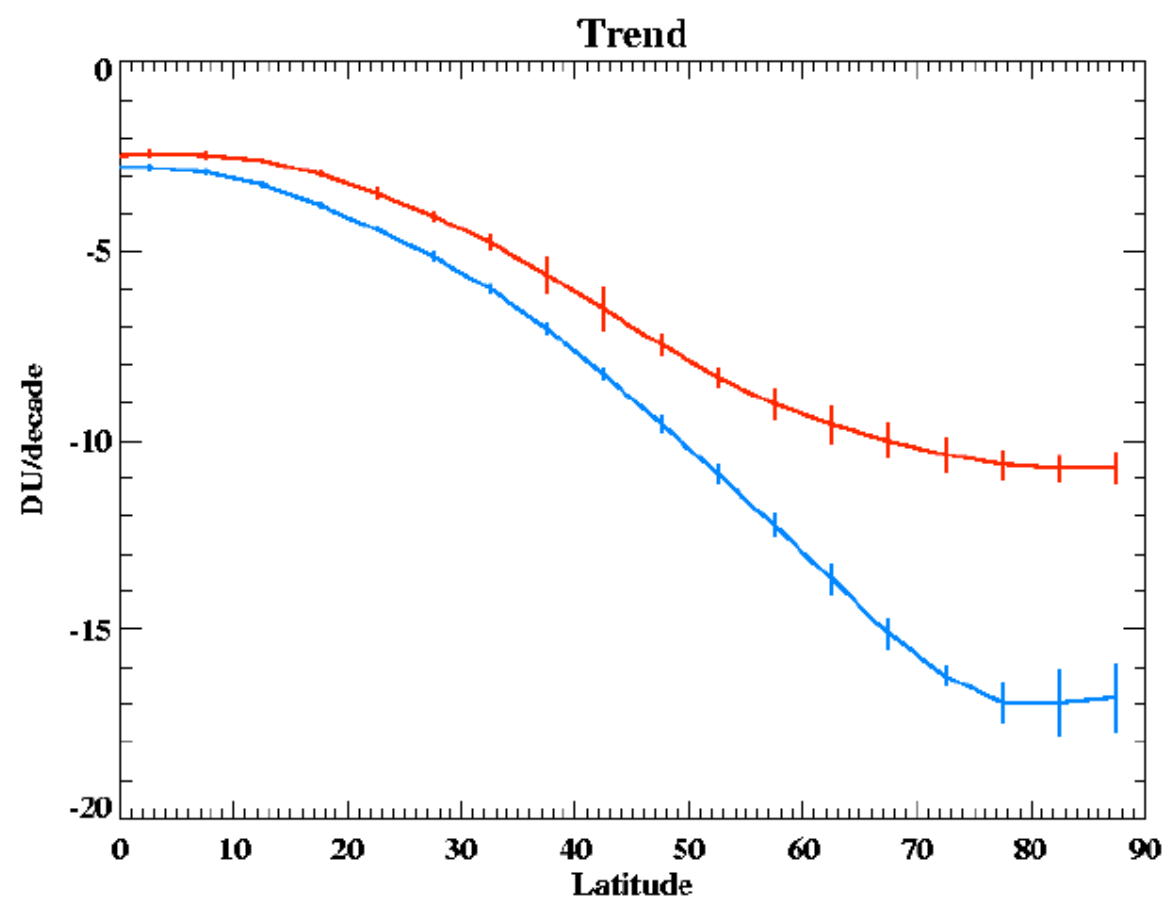


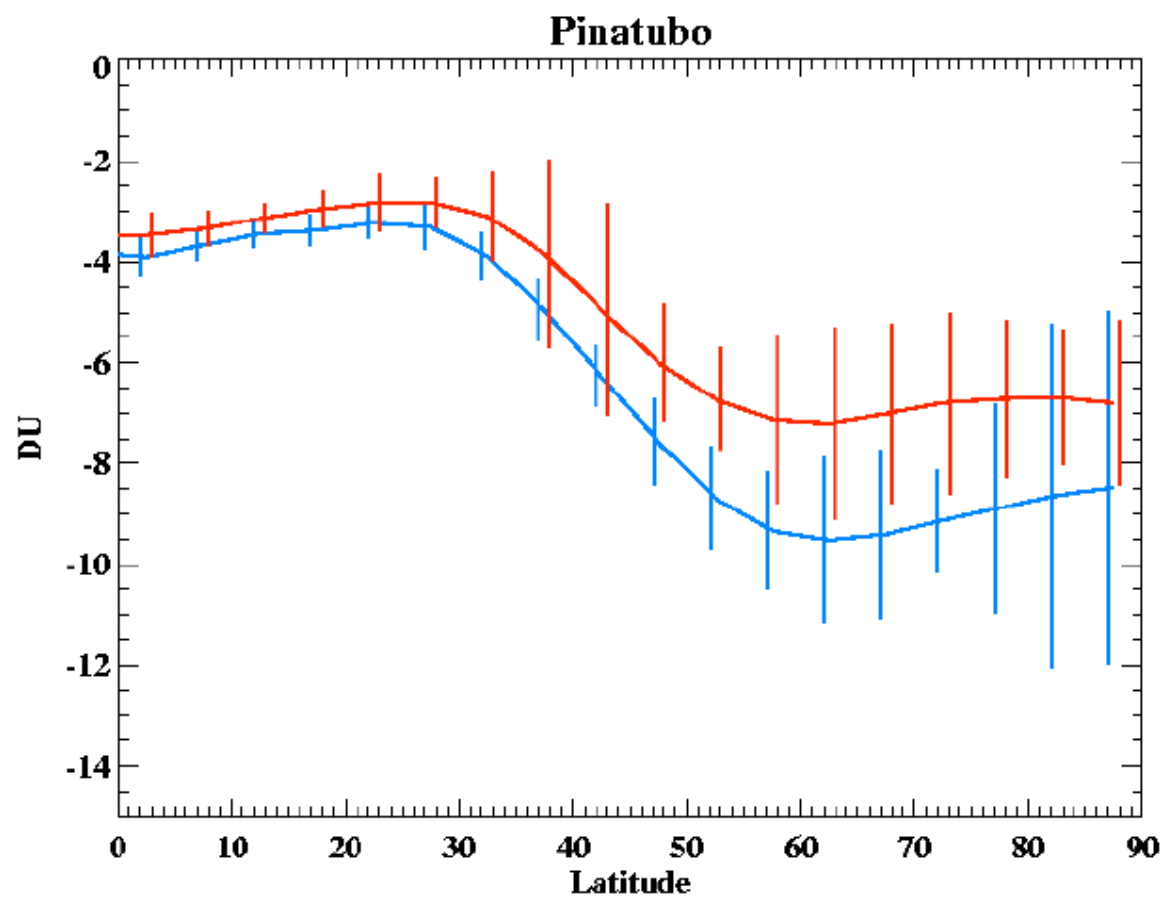




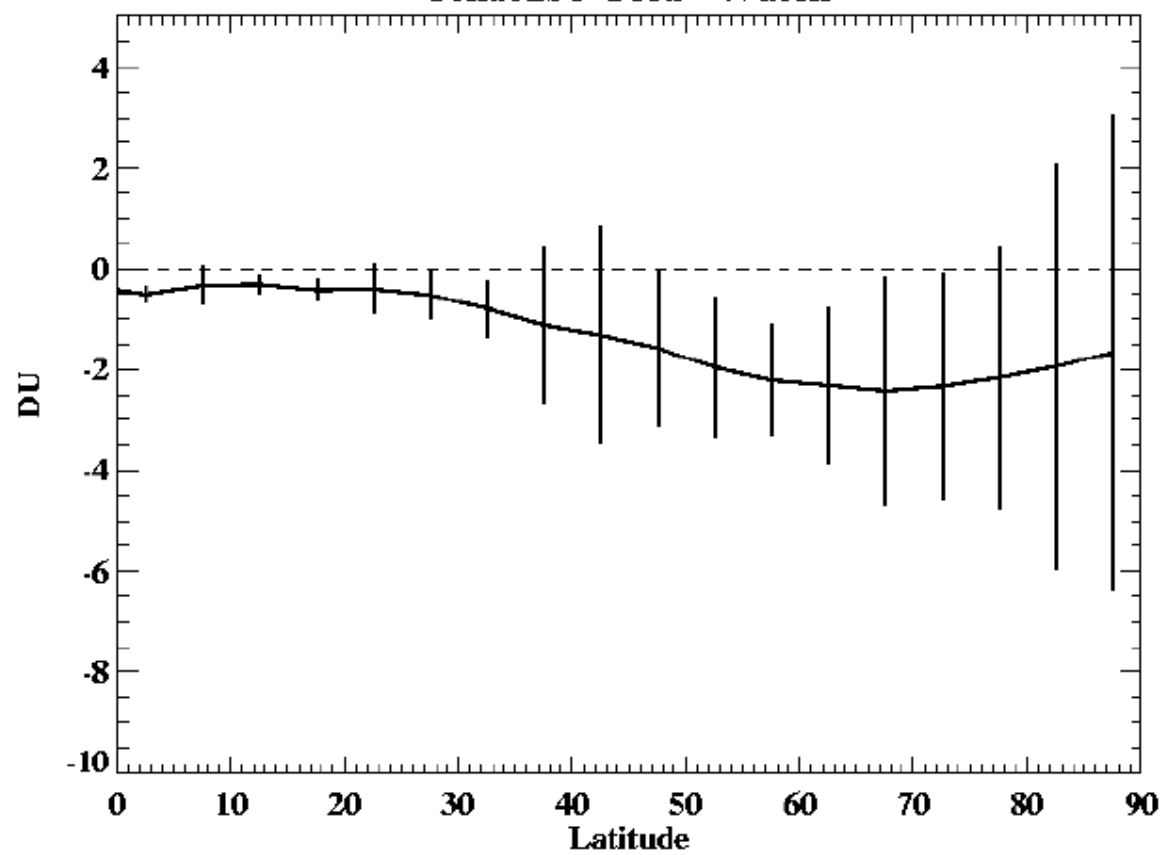


# **Time-Series Analysis**





### Pinatubo Cold - Warm

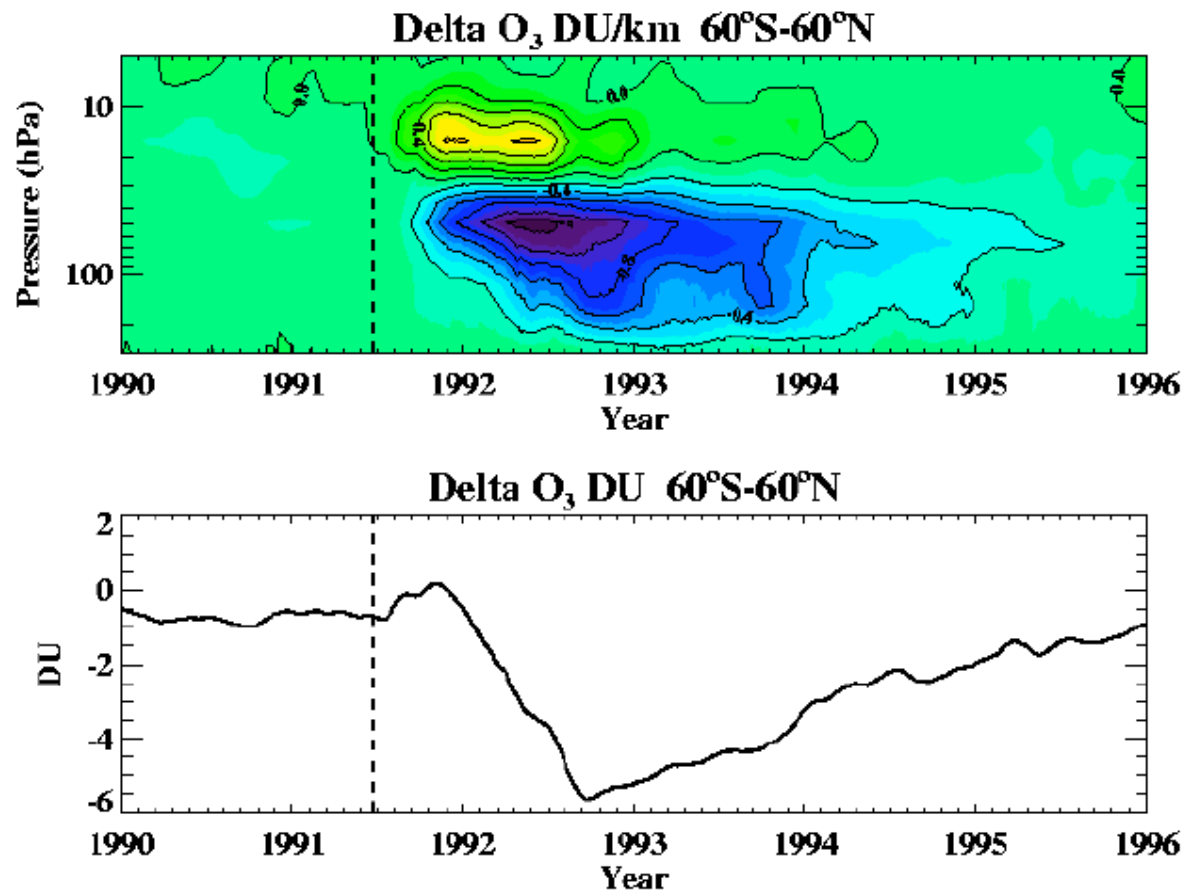






# **Some Results with Interannually Varying Meteorology from GSFC CTM**

# Difference between simulations with and without Pinatubo aerosol



# If Pinatubo had erupted in 1975 at low chlorine amounts

